

Patent Claims:

- 1     1.     Apparatus for warning of differential pressure during the  
2           opening of a pressure-loaded closure device (1) of an  
3           opening in the aircraft fuselage by means of an opening  
4           mechanism (4; 100, 105), characterized in that an air guide  
5           passage (6; 206, 207) is provided from the side with higher  
6           pressure (P) to the side with lower pressure (A), which is  
7           closeable by a valve (5; 209), whereby the valve (5; 209)  
8           is controllable with a control lever (4; 208) placed in  
9           operative connection with the opening mechanism (4; 100,  
10          105), and produces an acoustic signal upon the opening of  
11          the valve (5; 209) and an existing differential pressure.
  
- 1     2.     Apparatus according to claim 1, characterized in that the  
2           valve (5) is connected with a signal producing device (8),  
3           for example a whistle for the producing of an acoustic  
4           signal.
  
- 1     3.     Apparatus according to claim 1, characterized in that the  
2           valve (5) itself comprises means for the producing of an  
3           acoustic signal, for example a hissing or rushing.
  
- 1     4.     Apparatus according to one of the claims 1 to 3,  
2           characterized in that the control lever (4) is embodied as  
3           a door operating lever, which is placed in operative  
4           connection with the valve (5) via a mechanical connection

(9), such as a Bowden cable arrangement or a tension cable arrangement or a lever/rod mechanism or a transmission.

5. Apparatus according to one of the claims 1 to 4, characterized in that, in the operation of the control lever (4) a first condition is reached, in which the valve (5) opens and, for an existing differential pressure, an acoustic warning signal is provided.

6. Apparatus according to claim 5, characterized in that the operating of the control means results in a second condition, if no differential pressure exists and thus the opening process is able to further proceed.

7. Apparatus according to one of the claims 1 to 6, characterized in that the opening means further comprises a flap (4A) that covers the door operating lever, and an operative connection (9A) is provided between valve (5) and flap (4A), whereby the valve (5) is opened upon operation of the flap (4A).

8. Apparatus according to one of the claims 1 to 7, characterized in that the air guide passage (6) is provided in the door (1).

9. Apparatus according to one of the claims 1 to 8, characterized in that the air guide passage (6) is provided in a door frame (2) surrounding the door (1).

- 1     **10.** Apparatus according to one of the claims 1 to 9,  
2     characterized in that the air guide passage (6) and/or the  
3     signal producing device (8), in connection with a  
4     differential pressure, guides the airflow in a targeted  
5     manner in direction of the operating hand.
- 1     **11.** Apparatus according to one of the claims 1 to 10,  
2     characterized in that the air guide passage is embodied as  
3     connection pipe (6) or as a different type of air channel.
- 1     **12.** Apparatus according to one of the claims 1 or 8,  
2     characterized in that the air guide passage is provided  
3     from the passenger cabin (P) via a through-flow opening  
4     (206) in an aircraft door (1) in the area of the hand lever  
5     box (106) to the outside environment (A).
- 1     **13.** Apparatus according to one of the claims 1, 8 or 12,  
2     characterized in that the air guide passage proceeds via  
3     the valve (209) and a connected air guide device (207) to  
4     the through-flow opening (206).
- 1     **14.** Apparatus according to one of the claims 12 or 13,  
2     characterized in that the air guide device (207) is  
3     positioned by means of a flange (210) on the door structure  
4     (110) in the area of the hand lever box (106).

1    **15.** Apparatus according to one of the claims 1 or 4,  
2       characterized in that the control lever (208) is provided  
3       on its free end with a roller (218), which, for the closing  
4       of the valve (209), presses a slide bolt (215) with  
5       connected seal (217) on a valve flange (213), as well as  
6       for opening the valve (209) the spring-loaded slide bolt  
7       (215) is released through rotation of the control lever  
8       (208) and thus clears an out-flow opening in the valve  
9       flange (213).

1    **16.** Apparatus according to claim 15, characterized in that the  
2       opening in the valve flange (213), in-flow opening (212) on  
3       the valve housing (211) as well as the seal rubber (217)  
4       are embodied for producing a hissing/rushing acoustic  
5       signal.

1    **17.** Apparatus according to one of the claims 15 or 16,  
2       characterized in that the seal rubber (217) is loaded in  
3       direction of the out-flow opening of the valve (209) with  
4       an existing pressure difference, and thereby closes the  
5       opening additionally to the pressure of the slide bolt  
6       (215).

1    **18.** Apparatus according to one of the claims 1 or 5,  
2       characterized in that the control lever (208) is arranged  
3       on the locking shaft (105) of the door opening mechanism  
4       (100), and through rotation of the locking shaft (105), the  
5       free end of the control lever (208) is moved in a circular

6 arc path, whereby an opening of the valve (209) takes place  
7 before the door opening mechanism (100) completely releases  
8 the aircraft door (1).

1 **19.** Apparatus according to one of the preceding claims,  
2 characterized in that, for the closed condition of the  
3 valve (209), an over-travel of the control lever (208) past  
4 the dead center point is provided on the motion path of the  
5 free end of the lever (208).